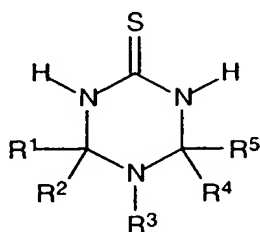


**WE CLAIM:**

1. A thermally developable composition comprising a non-photosensitive source of reducible silver ions, and a triazine-thione compound represented by the following Structure (I):



(I)

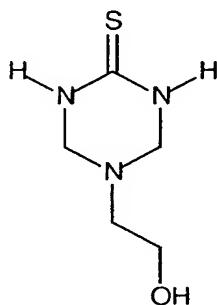
- wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$ , independently represent a substituent attached to the triazine-thione ring by a single bond.
2. The thermally developable composition of claim 1 wherein  $R^1$ ,  $R^2$ ,  $R^4$ , and  $R^5$  each individually represent hydrogen, alkyl groups, cycloalkyl groups, alkenyl groups, alkynyl groups, aralkyl groups, aryl groups, aromatic or non-aromatic heterocyclic groups, or divalent, trivalent, or tetravalent linking groups, and
- $R^3$  represents hydrogen, an alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group, an aromatic or non-aromatic heterocyclic group, an alkoxy group, an aryloxy group, an alkyl(or aryl)-SO<sub>2</sub>- group, an alkyl(or aryl)-SO- group, an alkyl(or aryl)-(C=O)- group, an alkyl(or aryl)-(C=O)O- group, an alkyl(or aryl)-O(C=O)- group, or a  $R''R'''N(C=O)-$  or  $R''R'''NSO_2-$  group wherein  $R''$  and  $R'''$  are independently hydrogen, alkyl, or aryl groups, or  $R^3$  is a divalent, trivalent, or tetravalent linking group.
3. The thermally developable composition of claim 1 wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$  individually represent hydrogen, alkyl groups, cycloalkyl

groups, carboxyalkyl groups, hydroxyalkyl groups, alkylene linking groups, phenyl groups, or alkylene oxide linking groups.

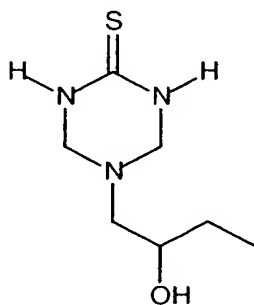
4. The thermally developable composition of claim 3 wherein  
5  $R^1$ ,  $R^2$ ,  $R^4$ , and  $R^5$  are each hydrogen.

5. The thermally developable composition of claim 1 wherein  
said triazine-thione compound is represented by one or more of the following  
Compounds I-1 to I-68:

10

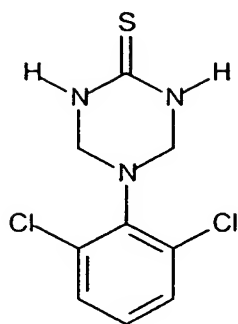


(I-1)



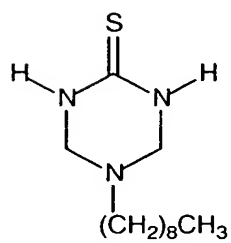
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(I-2)



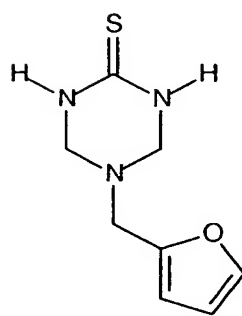
(I-3)

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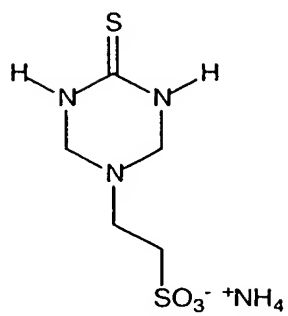


(I-4)

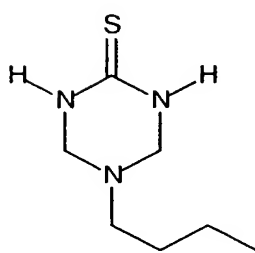
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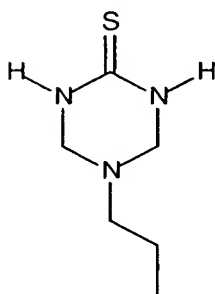
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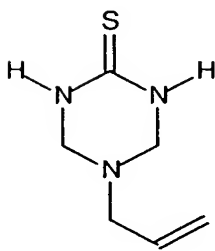
(I-6)



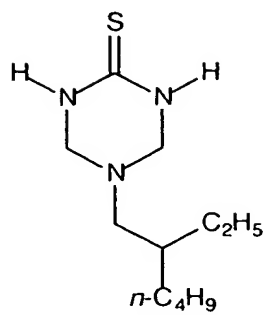
(I-7)



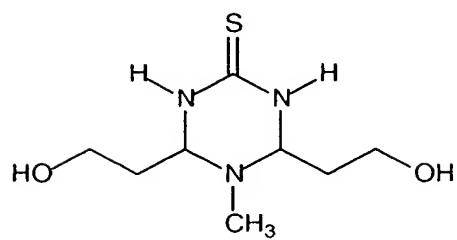
(I-8)



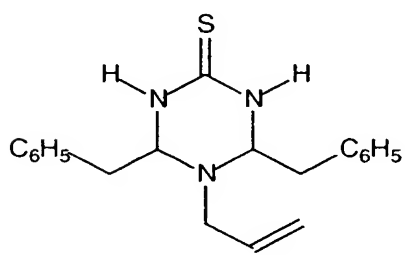
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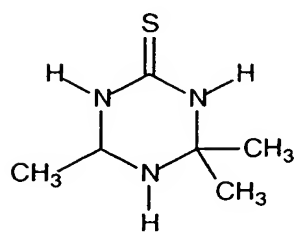
(I-10)



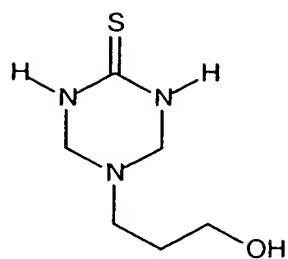
(I-11)



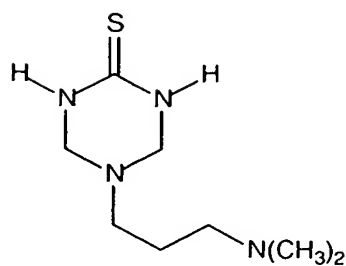
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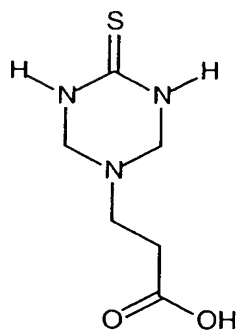
(I-13)



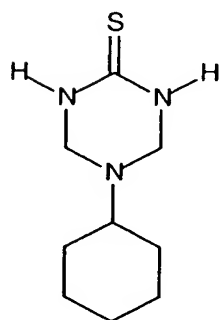
(I-14)



(I-15)



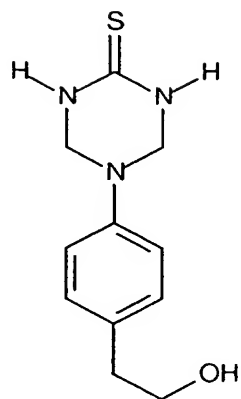
(I-16)



(I-17)

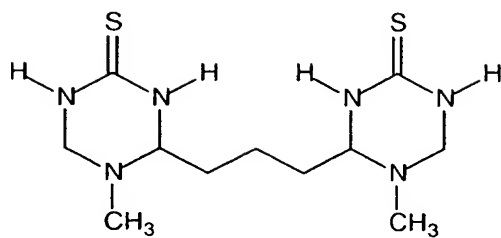
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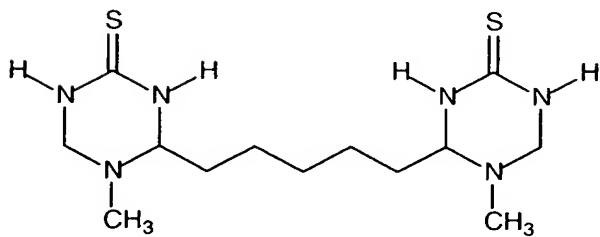
(I-18)

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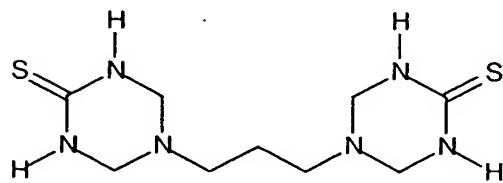
(I-19)

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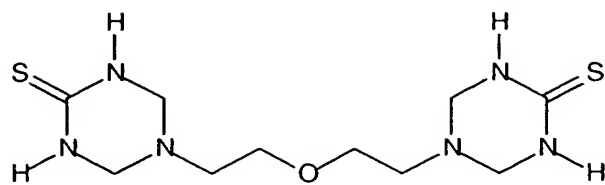


(I-20)

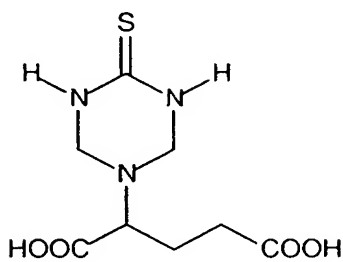
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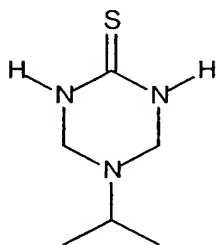
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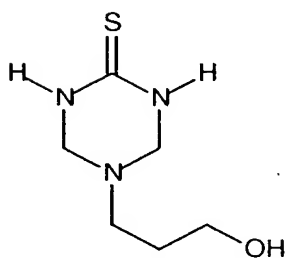
(I-22)



(I-23)

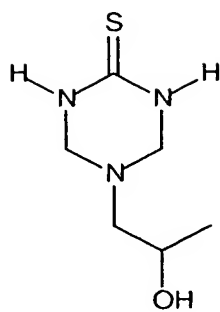


(I-24)

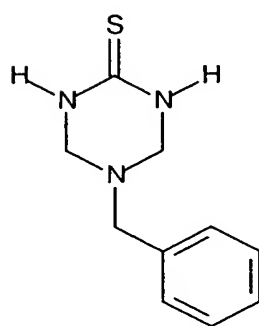


(I-25)

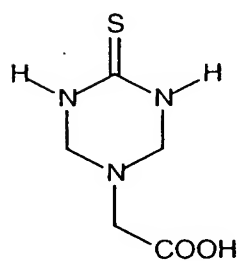




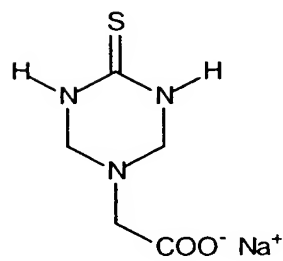
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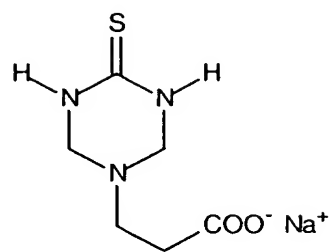
(I-27)



(I-28)

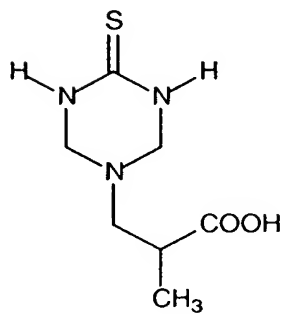


(I-29)



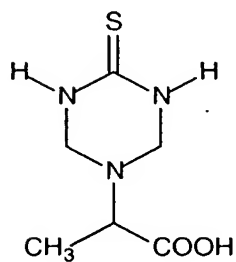
(I-30)

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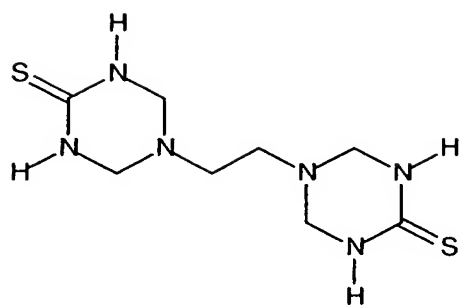
(I-31)

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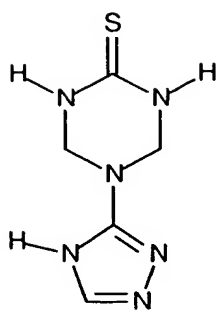


(I-32)

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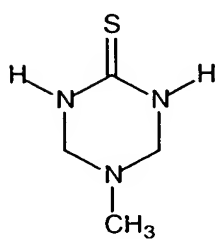


(I-33)



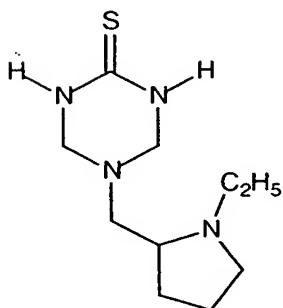
(I-34)

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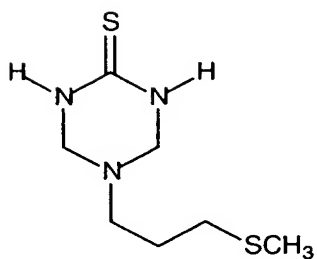
(I-35)

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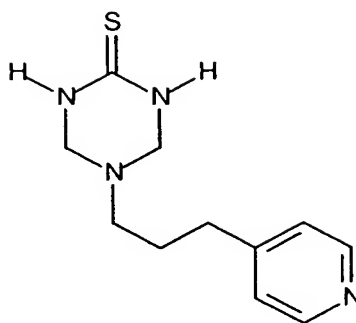


(I-36)

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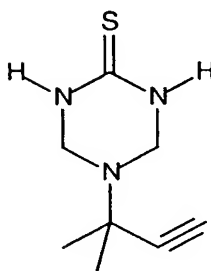


(I-37)

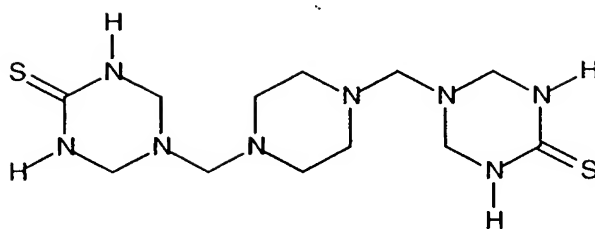


(I-38)

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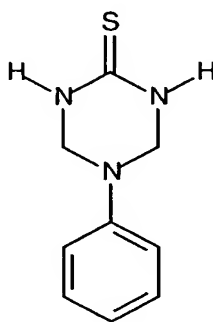


(I-39)



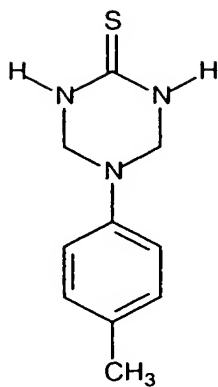
(I-40)

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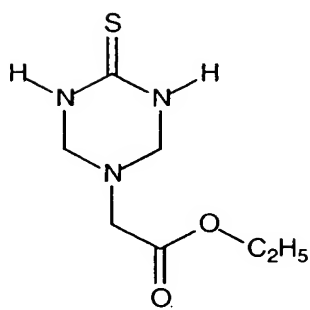
(I-41)

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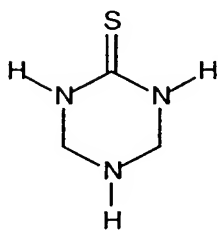
(I-42)

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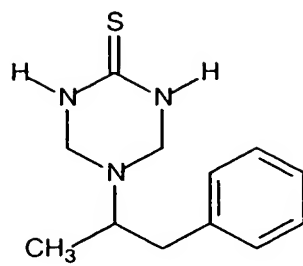


(I-43)

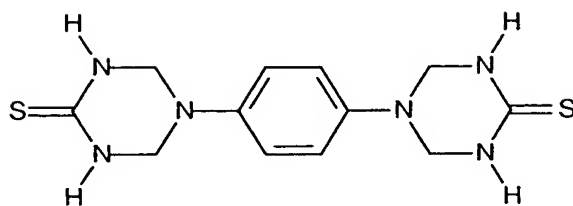
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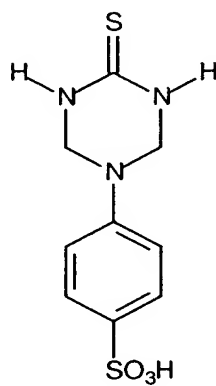
(I-44)



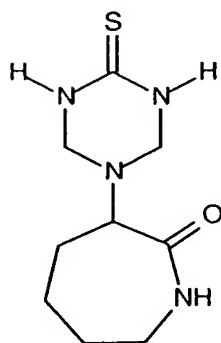
(I-45)



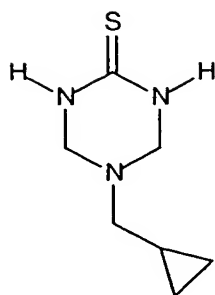
(I-46)



(I-47)

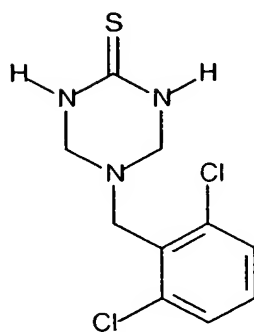


(I-48)



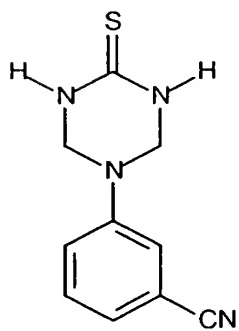
(I-49)

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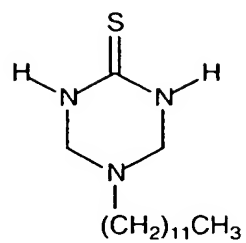


(I-50)

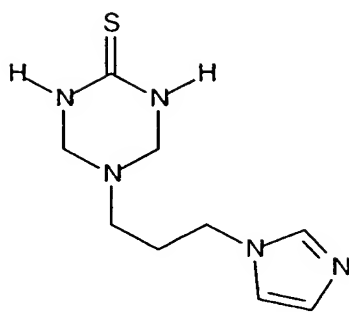
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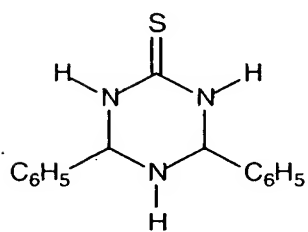
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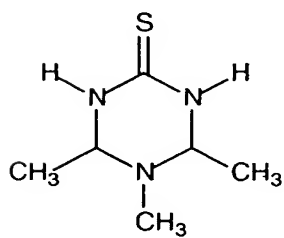
(I-52)



(I-53)

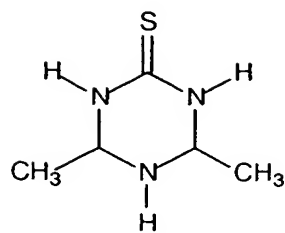


(I-54)

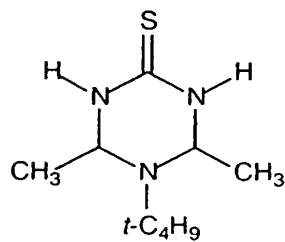


(I-55)

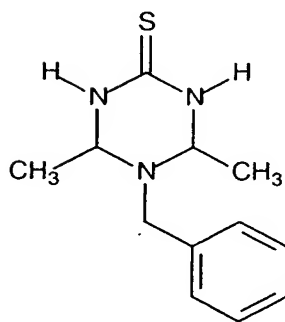




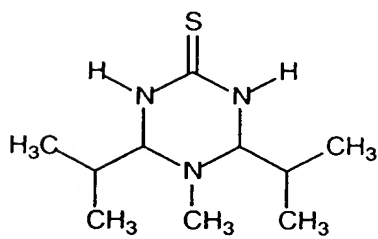
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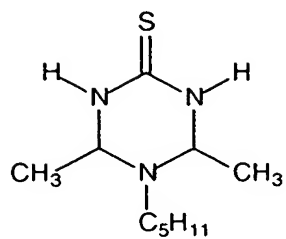
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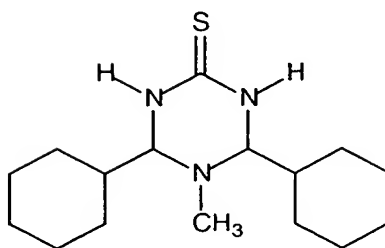
(I-58)



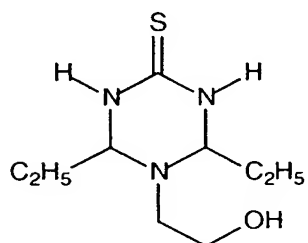
(I-59)



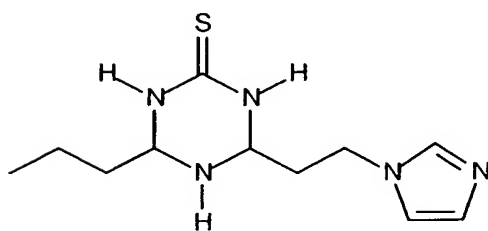
(I-60)



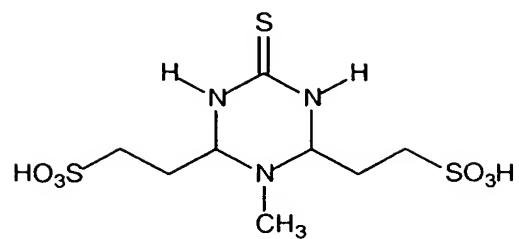
(I-61)



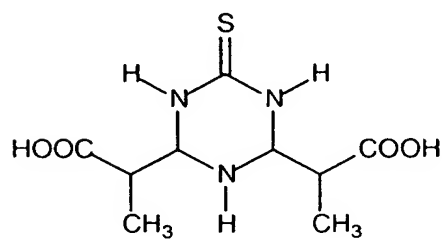
(I-62)



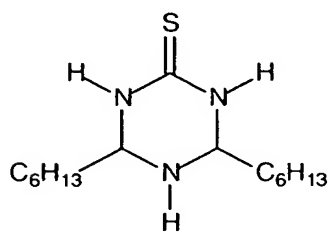
(I-63)



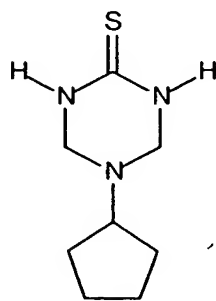
(I-64)



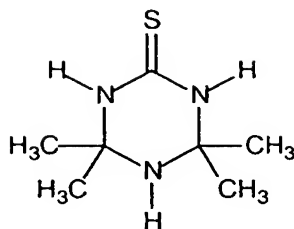
(I-65)



(I-66)



(I-67)



(I-68)

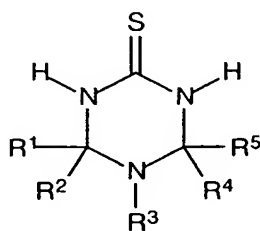
- 5                      6.        The thermally developable composition of claim 1 wherein  
said non-photosensitive source of reducible silver ions is an organic silver salt  
other than a silver carboxylate.
- 10                     7.        The thermally developable composition of claim 1 wherein  
said non-photosensitive source of reducible silver ions is a silver salt of a  
compound containing an imino group.
- 15                     8.        The thermally developable composition of claim 7 wherein  
said non-photosensitive source of reducible silver ions is a silver salt of  
benzotriazole or a substituted derivative thereof, or mixtures of such silver salts.
- 20                     9.        The thermally developable composition of claim 1 that is an  
aqueous-based composition and further comprises predominantly one or more  
hydrophilic binders or a polymeric latex.
10.       The thermally developable composition of claim 9  
comprising predominantly one or more hydrophilic binders that are gelatin or  
gelatin derivatives, polyvinyl alcohol, or cellulosic materials.
- 25                     11.       The thermally developable composition of claim 1 that is  
photosensitive and further comprises a photosensitive silver halide.

12. The thermally developable composition of claim 11 comprising one or more preformed photosensitive silver halides.

13. The thermally developable composition of claim 11 comprising a photosensitive silver halide that is provided as tabular grains.

14. The thermally developable composition of claim 1 further comprising a reducing agent composition that comprises a hindered phenol or an ascorbic acid.

15. A thermally developable material comprising a support and having thereon at least one thermally developable layer, and comprising a triazine-thione compound represented by the following Structure (I):



(I)

wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$ , independently represent a substituent attached to the triazine-thione ring by a single bond.

16. The thermally developable material of claim 15 wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$  individually represent hydrogen, alkyl groups, cycloalkyl groups, carboxyalkyl groups, hydroxyalkyl groups, alkylene linking groups, phenyl groups, or alkylene oxide linking groups.

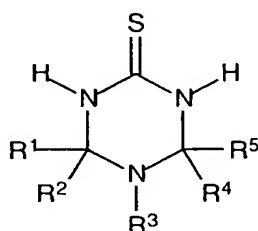
17. The thermally developable material of claim 15 that is photosensitive and further comprises a photosensitive silver halide in one or more

thermally developable layers, and said triazine-thione compound is present in the same layer as said photosensitive silver halide.

18. A black-and-white thermographic material that comprises a support having thereon one or more thermally-developable imaging layers comprising a binder and in reactive association, a non-photosensitive source of reducible silver ions, and a reducing composition for said non-photosensitive source of reducible silver ions, and

a triazine-thione compound represented by the following

Structure (I):



(I)

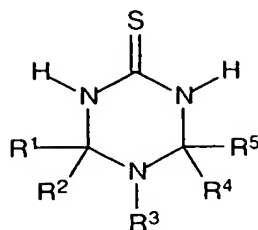
- wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$ , independently represent a substituent attached to the triazine-thione ring by a single bond.

19. A photothermographic material that comprises a support having thereon one or more thermally developable imaging layers comprising a binder and in reactive association, a photosensitive silver halide, a non-photosensitive source of reducible silver ions, a reducing composition for said non-photosensitive source reducible silver ions, and

a triazine-thione compound represented by the following

Structure (I):

25



(I)

wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$ , independently represent a substituent attached to  
 5 the triazine-thione ring by a single bond.

20. The photothermographic material of claim 19 wherein  $R^1$ ,  $R^2$ ,  $R^4$ , and  $R^5$  each individually represent hydrogen, alkyl groups, cycloalkyl groups, alkenyl groups, alkynyl groups, aralkyl groups, aryl groups, aromatic or  
 10 non-aromatic heterocyclic groups, or divalent, trivalent, or tetravalent linking groups, and

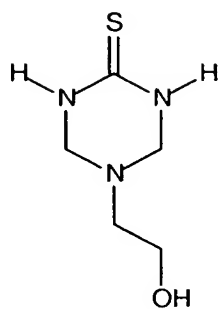
$R^3$  represents hydrogen, an alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group, an aromatic or non-aromatic heterocyclic group, an alkoxy group, an aryloxy group, an alkyl(or  
 15 aryl)-SO<sub>2</sub>- group, an alkyl(or aryl)-SO- group, an alkyl(or aryl)-(C=O)- group, an alkyl(or aryl)-(C=O)O- group, an alkyl(or aryl)-O(C=O)- group, or a  $R''R'''N(C=O)-$  or  $R''R'''NSO_2-$  group wherein  $R''$  and  $R'''$  are independently hydrogen, alkyl, or aryl groups, or  $R^3$  is a divalent, trivalent, or tetravalent linking group.

20

21. The photothermographic material of claim 20 wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$  individually represent hydrogen, alkyl groups, cycloalkyl groups, carboxyalkyl groups, hydroxyalkyl groups, alkylene linking groups, phenyl  
 groups, or alkylene oxide linking groups.

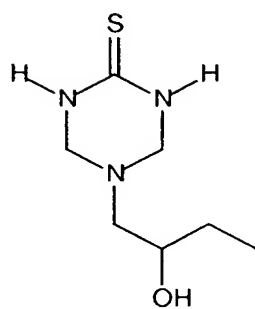
25

22. The photothermographic material of claim 20 wherein said triazine-thione compound is represented by one or more of the following  
 Compounds I-1 to I-68:



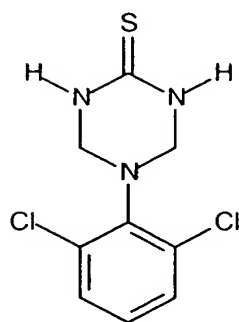
(I-1)

5



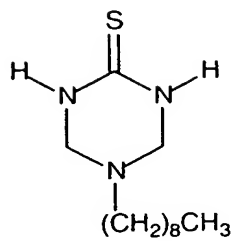
(I-2)

10

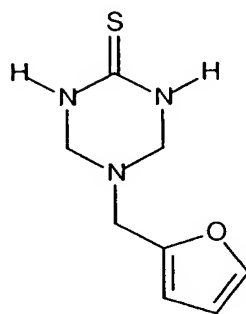


(I-3)

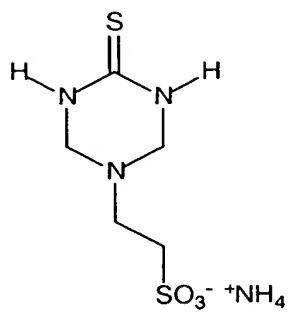




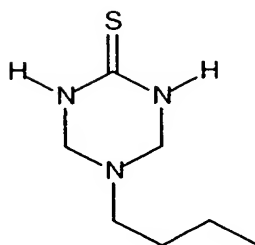
(I-4)



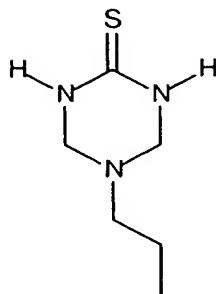
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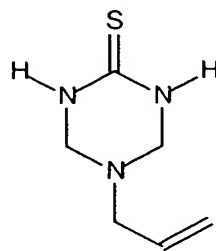
(I-6)



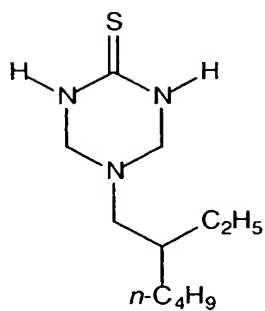
(I-7)



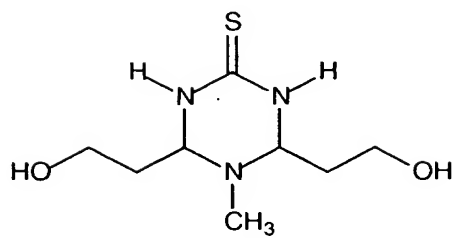
(I-8)



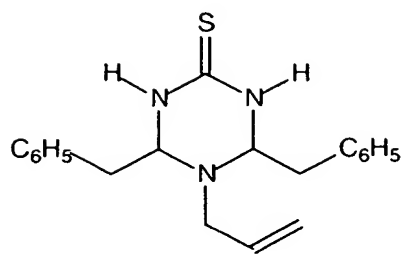
(I-9)



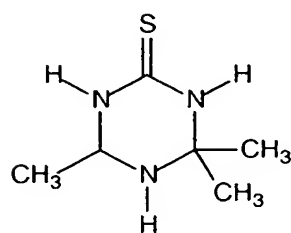
(I-10)



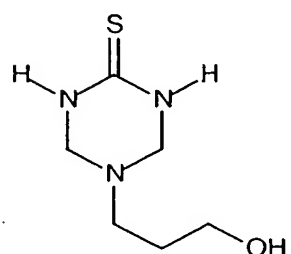
(I-11)



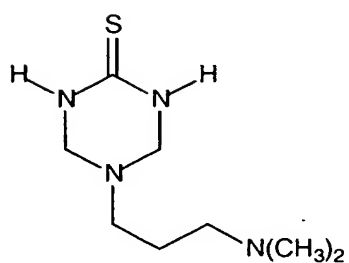
(I-12)



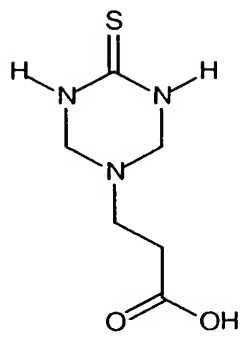
(I-13)



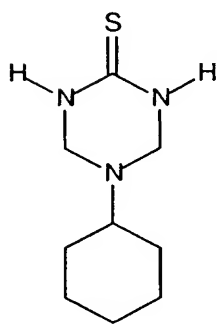
(I-14)



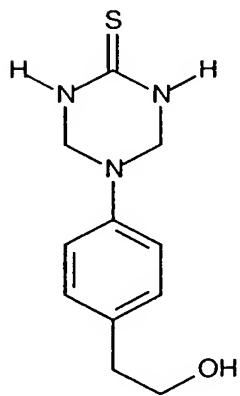
(I-15)



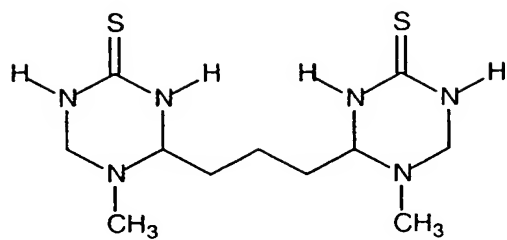
(I-16)



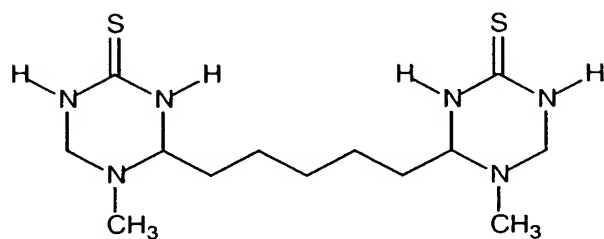
(I-17)



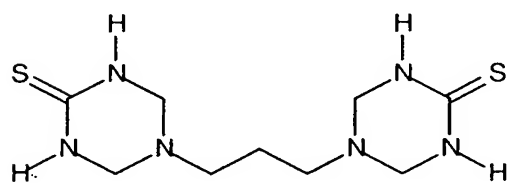
(I-18)



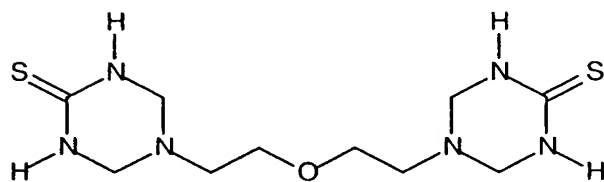
(I-19)



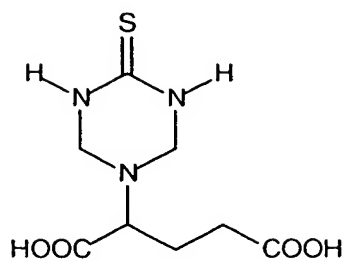
(I-20)



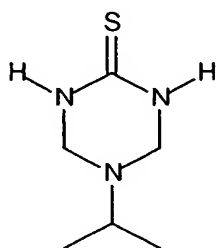
(I-21)



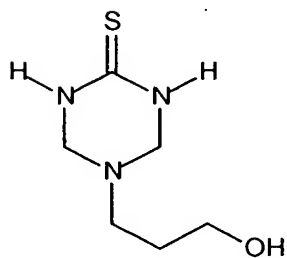
(I-22)



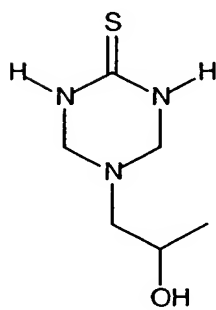
(I-23)



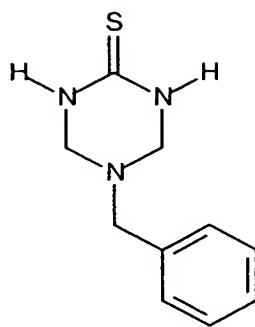
(I-24)



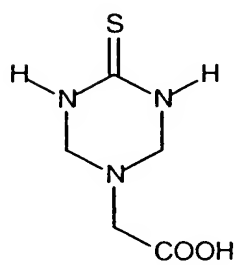
(I-25)



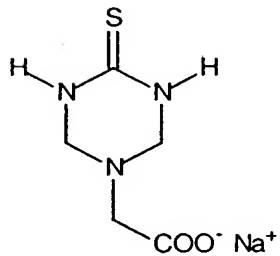
(I-26)



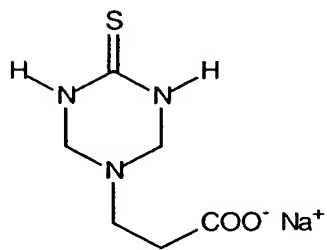
(I-27)



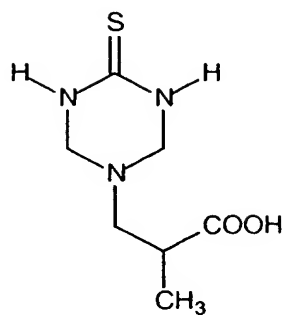
(I-28)



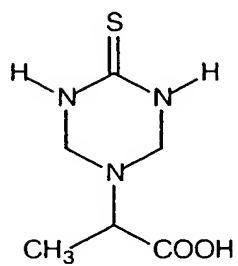
(I-29)



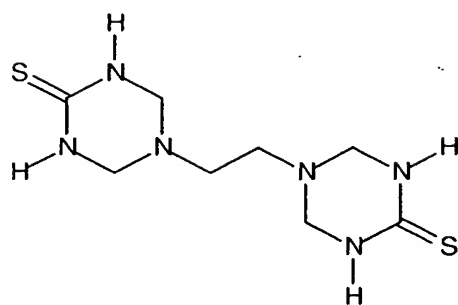
(I-30)



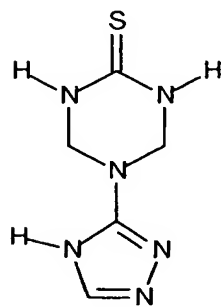
(I-31)



(I-32)



(I-33)



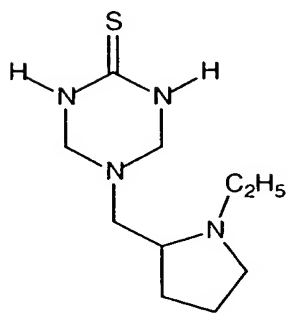
(I-34)





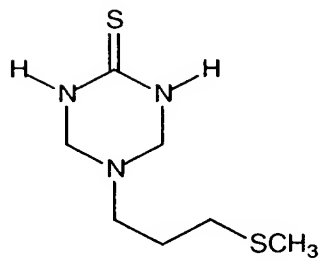
(I-35)

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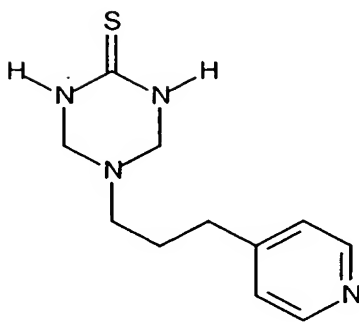


(I-36)

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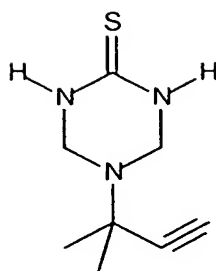


(I-37)



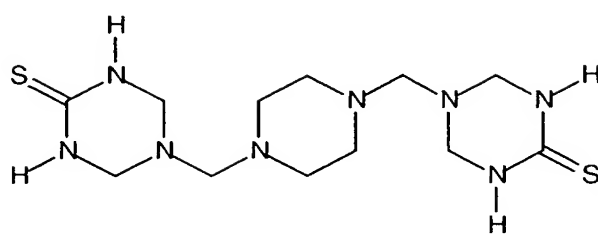
(I-38)

15



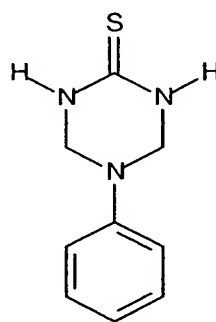
(I-39)

5

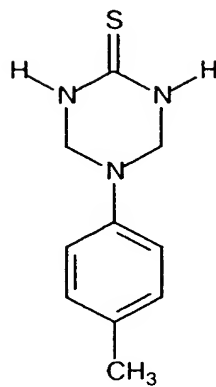


(I-40)

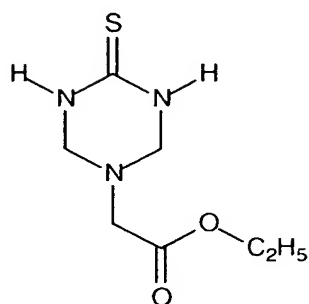
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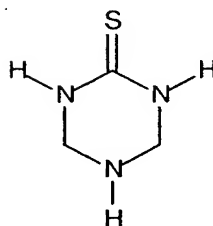
(I-41)



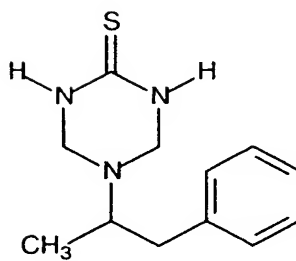
(I-42)



(I-43)



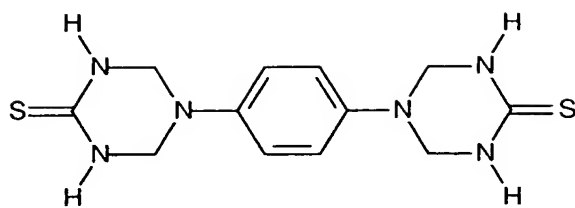
(I-44)



(I-45)

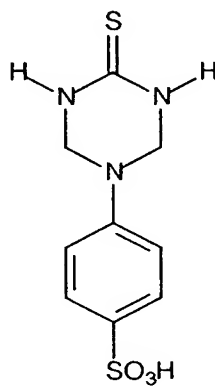
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10



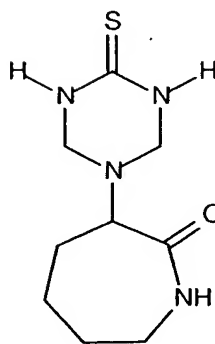
(I-46)

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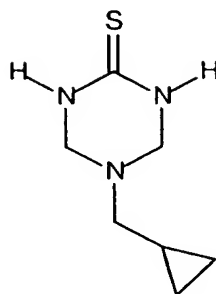


(I-47)

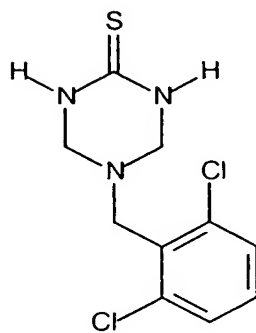
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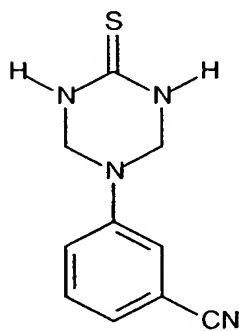
(I-48)



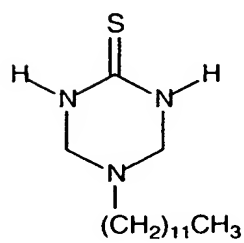
(I-49)



(I-50)



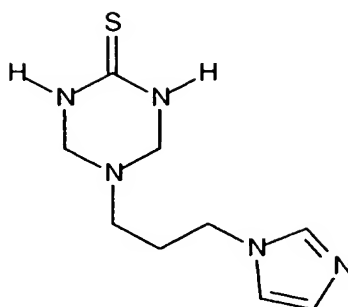
(I-51)



(I-52)

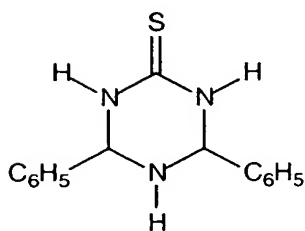
5

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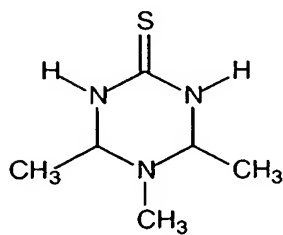
(I-53)

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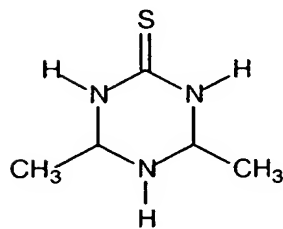


(I-54)

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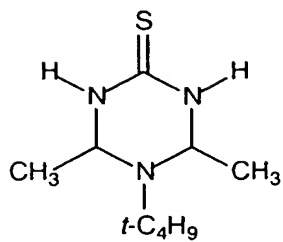


(I-55)

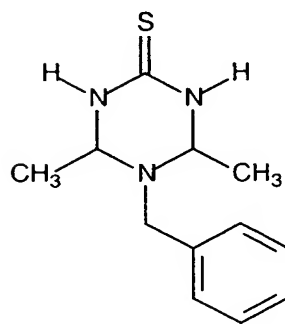


(I-56)

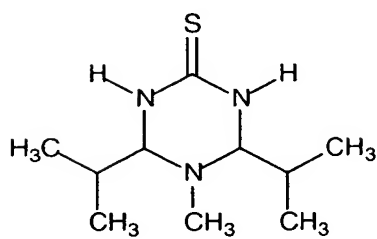
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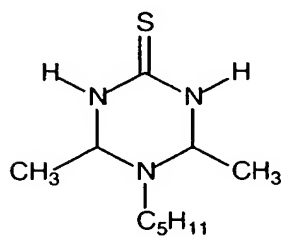
(I-57)



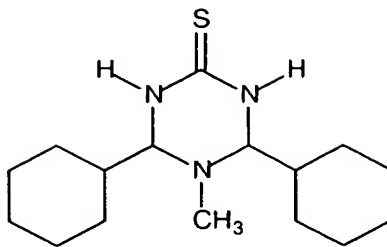
(I-58)



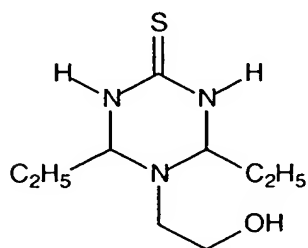
(I-59)



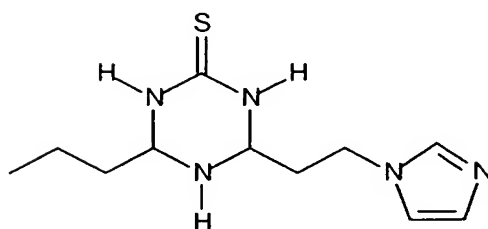
(I-60)



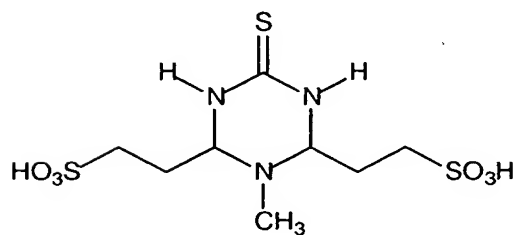
(I-61)



(I-62)

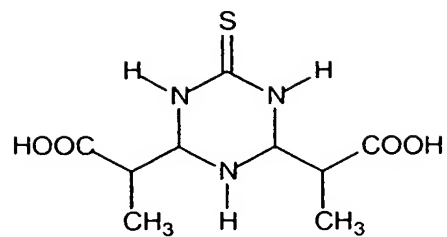


(I-63)

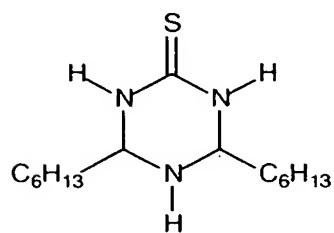


(I-64)

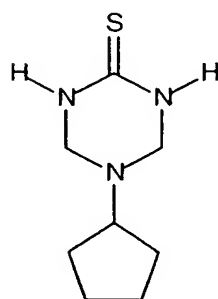




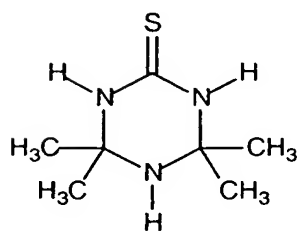
(I-65)



(I-66)



(I-67)



(I-68)

23. The photothermographic material of claim 19 wherein said non-photosensitive source of reducible silver ions is a silver salt of a compound containing an imino group.

5                    24. The photothermographic material of claim 23 wherein said non-photosensitive source of reducible silver ions is a silver salt of benzotriazole or a substituted derivative thereof, or mixtures of such silver salts.

10                   25. The photothermographic material of claim 19 that is an aqueous-based material and comprises predominantly one or more hydrophilic binders or polymeric latices in said one or more thermally developable imaging layers.

15                   26. The photothermographic material of claim 25 comprising predominantly one or more hydrophilic binders that are gelatin or gelatin derivatives, polyvinyl alcohol, or cellulosic materials.

20                   27. The photothermographic material of claim 19 wherein said photosensitive silver halide is a preformed photosensitive silver halide provided as tabular grains.

28. The photothermographic material of claim 19 wherein said reducing agent composition comprises a hindered phenol or an ascorbic acid.

25                   29. The photothermographic material of claim 19 further comprising a protective layer over said one or more thermally-developable imaging layers, an antihalation layer on the backside of said support, or both.

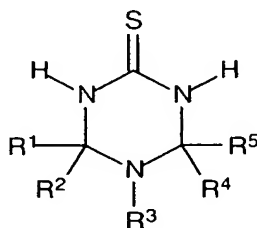
30                   30. The photothermographic material of claim 19 further comprising a protective layer over said one or more thermally-developable

imaging layers, an antihalation layer between said support and said one or more thermally-developable imaging layers, or both.

31. The photothermographic material of claim 19 wherein said  
5 triazine-thione compound is present in an amount of from about  $1 \times 10^{-5}$  to about  $1.0 \text{ mol/m}^2$ .

32. The photothermographic material of claim 19 further  
comprising on the opposite back side of said support, one or more additional  
10 thermally developable layers that can have the same or different composition as the thermally developable layers on said front side of said support.

33. The photothermographic material of claim 32 further  
comprising in said one or more thermally developable layers on said back side of  
15 said support, a triazine-thione compound represented by the following Structure (I):



(I)

20 wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$ , independently represent a substituent attached to the triazine-thione ring by a single bond.

34. A black-and-white aqueous-based photothermographic  
25 material that comprises a transparent support having a front side thereof:

a) one or more thermally developable imaging layers each comprising a hydrophilic binder, and in reactive association,

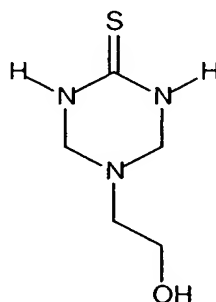
a preformed photosensitive silver bromide or silver iodobromide provided in predominantly as tabular grains,

a non-photosensitive source of reducible silver ions that includes one or more silver carboxylates at least one of which is silver salt of benzotriazole,

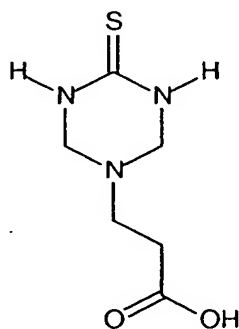
5 a reducing composition for said non-photosensitive source reducible silver ions that includes at least one hindered phenol or an ascorbic acid, and

b) a protective overcoat disposed over said one or more thermally developable imaging layers,

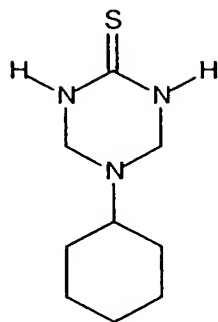
10 wherein said one or more thermally developable imaging layers further comprises a triazine-thione compound represented by one or more of the following Compounds I-1, I-16, I-17, I-24, and I-35, or mixtures thereof:



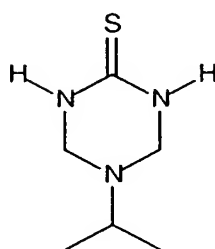
(I-1)



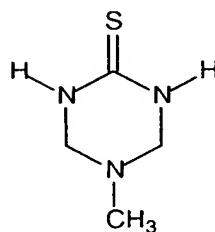
(I-16)



(I-17)



(I-24)



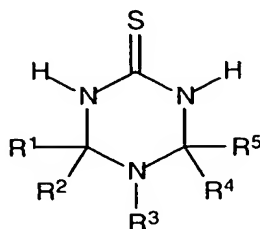
(I-35)

35. The photothermographic material of claim 34 further comprising an acutance dye on said frontside of said support.

36. A photothermographic material that comprises a support having on a frontside thereof, one or more frontside thermally developable imaging layers comprising a binder and in reactive association, a photosensitive silver halide, a non-photosensitive source of reducible silver ions, a reducing composition for said non-photosensitive source reducible silver ions, and

a triazine-thione compound represented by the following

Structure (I):



5

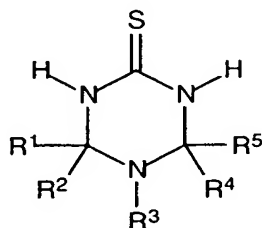
(I)

wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$ , independently represent a substituent attached to the triazine-thione ring by a single bond,

10 said material comprising on the backside of said support, one or more backside thermally developable imaging layers comprising a binder and in reactive association, a photosensitive silver halide, a non-photosensitive source of reducible silver ions, a reducing composition for said non-photosensitive source reducible silver ions, and

a triazine-thione compound represented by the following

15 Structure (I):



(I)

20 wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ , and  $R^5$ , independently represent a substituent attached to the triazine-thione ring by a single bond,

said frontside and backside thermally developable layers and compounds of Structure (I) in said frontside and backside layers having the same or different compositions.

37. A method of forming a visible image comprising:

- A) thermal imaging of the thermographic material of claim 18.

5 38. The method of claim 37 wherein said thermographic material comprises a transparent support, and said image-forming method further comprises:

- B) positioning said thermally imaged thermographic material between a source of imaging radiation and an imageable material that is sensitive to the  
10 imaging radiation, and

C) exposing said imageable material to the imaging radiation through the visible image in said thermally imaged thermographic material to provide an image in the imageable material.

15 39. A method of forming a visible image comprising:

- A) imagewise exposing the photothermographic material of claim 19 to electromagnetic radiation to form a latent image,

B) simultaneously or sequentially, heating said exposed photothermographic material to develop said latent image into a visible image.

20 40. The method of claim 39 wherein said photothermographic material comprises a transparent support, and said image-forming method further comprises:

- C) positioning said exposed and heat-developed photothermographic material with the visible image therein between a source of imaging radiation and an imageable material that is sensitive to said imaging radiation, and

D) exposing said imageable material to said imaging radiation through the visible image in said exposed and heat-developed photothermographic material to provide an image in said imageable material.

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41. The method of claim 40 wherein said imagewise exposing is carried out using visible or X-radiation.

42. The method of claim 41 wherein said photothermographic  
5 material is arranged in association with one or more phosphor intensifying screens.

43. An imaging assembly comprising the photothermographic material of claim 19 that is arranged in association with one or more phosphor intensifying screens.